Coagulation-dynamic membrane filtration process at constant flow rate for treating polluted river water

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ABSTRACT

Dynamic membrane has attractive features, compared to the traditional membrane technology. This work investigated the performance and filtration process of a dynamic membrane (DM) at a constant flow rate, which was formed by flocs, produced by river water pollutants reacting with poly aluminum chloride with a non-woven fabric filter as the support media. Effluent turbidity was studied as the marker of a dynamic membrane formation, and chemical oxygen demand (COD) and total phosphorus (TP) were surveyed to evaluate the process performance. The results showed that the combined coagulation–dynamic membrane process is effective in treating polluted river water. The COD and TP removal efficiencies were obtained in the DM forming process and after formation. The relationship of the running pressure versus the operation time was used to evaluate the filtration process, according to the combined models of the membrane fouling. The standard model plays the dominant role in the first stage of the DM reactor running process, and after it, the intermediate model plays the leading role.

Keywords: Coagulation; Dynamic membrane; Filtration process; Constant flow rate; Non-woven fabric filter